GOVERNMENT OF ANHDRA PRADESH
ABSTRACT

Labour, Factories, Boilers & Insurance Medical Services Department – Industrial Accidents –Noncompliance of Provisions under the Factories Act and Rules with respect to "work in confined space" resulting into accidents in certain factories-Standard Operating Procedure (SOP) with operational Guidelines and instructions for ease of compliance – Notification – Orders – Issued.

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Labour Factories Boilers & Insurance Medical Services (Labour.II) Department

G.O.Ms.No.10 Dated:06/07/2023

Read

From the DOF, Vijayawada, Lr. No. LAE05-12021/ 51/2023-B,SEC-DOF, Dt:18.04.2023.

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**ORDER:-**

It has been brought to the notice of the Government by the Director of Factories, Andhra Pradesh regarding the potential safety risks associated while workers are required or allowed to work in "confined spaces" in factories for various maintenance related activities though the relevant provisions under the Factories Act, 1948 are prescribing certain safety measures as legal obligation. In this regard, often there were gaps noticed which resulted into accidents, especially in small and medium sector factories, as such activities are non-routine by nature and often being carried on without adequate knowledge and competency towards adopting required safety measures. Therefore he has requested the Government for issue of Standard Operating Procedure (SOP) with detailed guidelines / instructions to factories in the State duly exercising the powers vested with Director of Factories, Andhra Pradesh under Rule 12-B of the Andhra Pradesh Factories Rules, 1950.

**2.** After careful examination of the proposal of Director of Factories, Andhra Pradesh, the Government of Andhra Pradesh have decided to notify the Standard Operating Procedure (SOP) with detailed guidelines / instructions to factories in the State duly exercising the powers vested with Director of Factories, Andhra Pradesh under Rule 12-B of the Andhra Pradesh Factories Rules, 1950. Accordingly, the following notification will be published in the Extraordinary issue of Andhra Pradesh Gazette: -

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**NOTIFICATION**

Industrial activities which result into accidents can be broadly classified as routine and non-routine activities. The production related operations/processes would fall into routine category whereas maintenance related activities would fall into non-routine category. The safety arrangements which are made for safe operation of the plant shall become offline and non-functional the moment the plant is stopped and offered for maintenance. Some of the maintenance activities are having high potential for accidents owing to their very nature itself. Work in "**Confined Space**" is one among them.

**2.** The provisions under the Factories Act, 1948 and the Andhra Pradesh, Factories Rules,1950 prescribes an obligation on the occupiers and managers of the factories under Factories Act towards safety of the workers required to work in "Confined Spaces". In order to facilitate the factory managements in operationalising the safety measures with much ease and better understanding in this regard and there by to prevent accidents in confined spaces in future, the detailed guidelines / instructions are issued to factories in the State duly exercising the powers vested with Director of Factories, Andhra Pradesh Under Rule 12-B of the Andhra Pradesh, Factories Rules, 1950 in the Annexure-I and Annexure-II appended herewith.

3. The Director of Factories, Andhra Pradesh is therefore requested to give vide publicity among all the Factories in the State and to see that to follow the guidelines and instructions scrupulously.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

Dr. M.HARI JAWAHARLAL
SECRETARY TO GOVERNMENT

To
The Director of Printing Stationery & Stores Purchase, Vijayawada.
(with a request to publish the said Notification and supply 100 copies to The Director of Factories, AP, Vijayawada.)
The Director of Factories, AP, Vijayawada.
Copy to:
The PS Hon'ble Minister (LFB&IMS)
The P.S. to Secretary to Government, LFB&IMS Department.
Law (B) Department.
Sf/Sc

//FORWARDED :: BY ORDER//

D. Krishna Kumar
SECTION OFFICER

## ANNEXURE –I

(G.O.Ms.No.10, Labour Factories Boilers & Insurance Medical Services (Lab.II) Department, Dt: 06/07/2023)

| SJB | **Work Permit System - Safety in Confined Space Entry & Work** |
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| **Scope** | These guidelines / instructions are applicable to all factories covered under the Factories Act1948 in the state, with effective from the date of issue or the date of registration of a factory under the Factories Act, 1948, whichever is later. |
| **Back Ground** | All the safety measures adopted for carrying the operations safely in a factory become non-operational when the plant/equipment etc in the factory are taken for cleaning, repairing and other maintenance activities. Some of these activities, which are non-routine and critical in nature, are causing more incidents of injury, death including property damage in factories during their execution. Therefore, prevention of incidents in these activities demand for additional set of safety measures for their safe completion. Entry & work in confined spaces, hot work, height work etc., are a few of them. |
| **Objective** | The Factories Act, 1948 and Andhra Pradesh Factories Rules prescribes a few safety measures for works like entry into confined space and working at Height etc. However, they are not adequately elaborated for addressing the complete job activities in each of the different possible situations, thereby, the organizations which are habituated to adopt unscientific methods in such works wherein safety of a worker remains a chance but not choice, are not being explicitly instructed or guided. Therefore, in order to bridge the gap and to create a minimum compliance base line for facilitating effective safety management in executing these jobs, it is proposed to issue operational guidelines for the above said critical jobs through a Standard Operating Procedure called "**Work Permit System**" |
| **Statutory** | Section 36 of Factories Act, 1948 prescribes an obligation for safety in entry into a confined space. Similarly, with respect to "Chemical Works" under Section 87 of Factories Act, 1948 read with Rule 95 Sch XV, the obligation for "Permit to Work" for entry into confined space has been stipulated vide Para 18 of the said rules. However, as the work in confined space is a complex situation having a spread of multiple risks to human health and safety, it is desirable to narrate an explicit procedure for enabling the factories to operationalize the legal requirement in an effective manner as and when such work arises. Therefore, certain additional instructions / guidelines on "**Safe Entry & Work in confined Space**" are hereby issued by the Chief Inspector of Factories in exercising the powers vested with him Under **Rule 12- B** of A.P. Factories Rules,1950 and without prejudice to the general responsibility of the Occupier to comply with the provisions of Section 7-A, for compliance in case of an entry / work in a confined space in any factory covered under Factories Act, 1948 in the state of Andhra Pradesh. |

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| **Saving** | These guidelines/instructions are intended for guidance towards minimum compliance level. They do not substitute any of the required safety measures and are issued without prejudice to any of the appropriate or additional safety and health measures to be adopted for safe execution of the intended jobs. If any safety & health measures in these guidelines are less favourable than those required to be adopted with respect to any specific job or become less favourable in course of time either due to new learnings or technological advancements, not withstanding anything contained in these guidelines, the more favourable requirements are deemed to be applicable. |
| **Examples** | The examples of non-routine/ Critical Activities related to Confined Space(s) are, but not limited to, cleaning, clearing, repairing, modification, alteration, inspection, testing, Hot works etc inside the reactors, storage tanks, Boilers, ESPs, Bins, Hoppers, Silos, Pipelines, Sumps, Pits, Drains, Trenches etc. |
| **Definitions** | a. **Confined Space**: Confined space means any space by reason of its construction shall as well as in relation to the nature of the work carried therein and where hazards to the persons entering into or working inside exist or are likely to develop during working.<br><br>It is an enclosed space with restricted means of entrance and exit or egress. It is not meant for normal/ continuous occupation of person(s). It may have either asphyxiating viz., oxygen deficient or oxygen enriched atmosphere or with corrosive, toxic, flammable, explosive gases, vapours, fumes or dust or atmosphere with risk of fire, explosion, engulfment and entanglement with other parts of Machinery when person(s) enters with an objective of work, repair, maintenance, cleaning, inspection or examination or testing. The configuration of such confined space may also be with an inwardly converging walls or of awkward shape which could lead to entrapment of Person(s). |
| | b. **Work Permit:** A Work Permit or Permit-to-Work is a pre-determined work procedures which integrate safety with the work to control certain types of work that are potentially hazardous. A Work Permit is a document which has written components, measures, and precautions to be taken for work to be done safely. It covers responsibilities of different authorities and persons, measures to be taken in the organization, monitoring such work to ensure safe entry, work, egress throughout the activity including completion. It includes emergency response and prior thinking process of rescuing a person(s) with plan, tools, and methods in place. |
| | **c. Confined space entry supervisor**:<br>Is an employee who is a supervisor incharge of the are a who is trained in confined space entry procedures, he verifies the confined space entry requirements are fulfilled and authorize the entry of person to enter such confined space. |

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| | d. **LOTO System:** All energy sources related to such space like Electrical / Hydraulic / Pneumatic energies are positively isolated duly following Lock Out-Tag Out (LOTO) System and securing Keys of such systems to avoid inadvertent operation of such system. |
| | e. **Job Hazard Analysis:** Job Hazard Analysis is a hazard assessment performed by the permit Initiator, receiver, and executor jointly be for ecommen cement of work to identify hazards and risks involved in the job and its related activities. This Hazard/Risk assessment shall be documented and used to provide training to the affected employees/contractors before commencement of work |
| | f. **Permit initiator**: Is an employee or trained / certified contractor under competent supervision, who initiates the permit and has an overall control of the work activity specified in the permit. In smaller factories, the Initiator may also play the role of 'Permit Authoriser' or 'Safety Officer' or both, if there are no separate employees available in any of these two roles in such factories. |
| | g. **Receiver / Executor**: Is an employee/contractor who is responsible to perform the work activity and is trained and certified to execute the task under a given type of permit. Executor is responsible to execute the job safely as per the permit requirement and adhere to the risk controls specified in the Job Hazard Analysis. |
| | h. **Permit Issuer / Authorizer**: An employee working in the area of permit scope. He / She is usually an area owner/ Department head who is responsible for operation of the area and will be accountable to ensure safe work environment for job executors and authorize the work under a given permit |
| | i. **Authorized Isolator**: A trained person in isolating all types of energy sources, who shall perform the 'Lock out and Tag out' of the equipment or process etc |
| | j. **Confined Space Authorized Entrant**: Employee/contract workers who are authorized to enter a confined space in the work permit. |
| | k. **Confined Space Attendant:** A responsible stand by person who shall remain outside the confined space to keep continuous watch on the activities carried out in side the confined space. He shall be competent to execute rescue operations and appropriate actions in case of emergency without entering the confined space. |
| | l. **Confined Space Rescuer**: A person who is specifically trained on confined space entry procedure and rescue operations. |
| | m. **Lower Explosive Limit (LEL)**: LEL is the minimum concentration of a vapour in air (or other oxidant) below which propagation of flame does not occur on contact with an ignition source. This is usually expressed as volume percentage of the vapours in air. |

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| | | n. **Upper Explosive Limit (UEL)**: UEL is the maximum concentration of a vapour in air (or other oxidant) above which propagation of flame does not occur on contact with and ignition source. This is usually expressed as a volume percentage of vapours in air. |
| | | 0. **Personal Protective Equipment (PPE):** The equipment which is appropriate for entry and work in confined space like Safety Shoes, Gloves, Appropriate Respiratory Protection including SCBA, Goggles, Face Shields, Safety Helmets etc and as identified by the permit issuer. |
| **Training** | | • Key personnel to perform roles of permit initiator, executor, Authorizers & rescuers shall be identified by occupier or Manager under Factories Act preferably be from employees only. The individuals involved in executing the permit to work systems including contractors shall be adequately trained to perform their duties and responsibilities and authorized to perform their roles in executing permit to work system. Refresh her training shall be conducted at lea stance a year. |
| | | • Every worker involved in execution of the permit shall be provided with adequate entraining. The persons entering in to the confined space shall be made aware of the hazards and risks involved in the entry & work inside the confined space, safety precautions taken and to be taken, rescue arrangements made and the procedure to be followed for rescue from the confined space. The list of safety precautions to be included, but not limited to, in the training are appended to this document at the end. |
| | | • The record of training shall be maintained and produced or caused to be produced on demand by Inspector |
| **Procedure** | **a** | 1. The occupier of a factory shall identify all confined spaces and the nature of hazards that are encountered in such spaces, normally or abnormally and arrange to regulate the entry or work inside the confined spaces by following "work permit System" for ensuring the safety and health at work |
| | **b** | 2. The Work Permit shall be maintained in at least 2 copies. In a factory where there is a separate safety officer is appointed to look after the compliance of Occupational Health and Safety matters, a 3rd copy shall also be maintained<br>• 1st Copy issued to executor<br>• 2nd Copy issued to Authorizer<br>• 3rd Copy issued to Safety Officer (If employed)<br>3. All the completed/cancelled permit copies shall be maintained in records at least for one year.<br>4. A copy of the sample work permit format is attached to these guidelines for reference. |

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| | c | Only authorized permit initiator shall initiate the permit and only authorized executor shall allow to accept the permit. The permits initiated or accepted by unauthorized personnel shall not be treated as valid. |
| | d | All information related to the work in confined space and the instructions given in this regard shall be accurately detailed. The work to be done shall be clearly defined. |
| | e | It shall also be ensured that the persons engaged in connection with work in Confined Space are medically fit in all respects taking into consideration the demands and nature of the work and not suffering from claustrophobia. |
| | f | Risk assessment of the activities to be carried out jointly by the permit initiator and the executor. All the personnel who so ever is involved in the work including the contractor shall be consulted to obtain inputs for the risk assessment |
| | g | The risk assessment shall be documented in the form of Job Hazard Analysis for ease of understanding. |
| | h | The permit and Job Hazard Analys is shall be recognized as a master instruction. No work other than that specified in the work permit shall be undertaken. If same job is to be carried out in different areas, each area warrants a separate permit |
| | i | Permit initiator, executor & Authorizer shall physically verify the site conditions & ensure that all the safety precautions are taken to manage the hazards and risk sand accordingly fill up & sign the permit. |
| | j | The work permit is valid only when all applicable columns of work permit checklist are filled in and signatures of all concerned (Initiator, Executor, Authorizer etc) are obtained |
| | k | It is the responsibility of the permit initiator to maintain the safe working conditions throughout the period of work.<br>The permit shall specify the time at which it comes into effect and for how long it remains in effect. If the work is not completed within the specified time & required to be continued, the permit initiator, executor & Safety representative shall again have a joint visit of the site and extend the period of permit (preferably not for more than next 8 hrs) after reassessing permit conditions. The permit initiator shall stay on site till the work under permit gets completed. Work permit extension beyond 6:00 PM shall be approved by Site head or his designee. |
| | l | In the event of change of Initiator or Executor during the work (e.g. shift change) before its completion, New initiator & executor shall verify the permit, understand the stage of work and allow it to progress by signing on the Permit.<br>Similarly, the Authorized Isolator (s) who has performed LOTO under the permit activity shall handover the keys of LOTO locks to the Authorized |

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| | | Isolator of the next shift, both the persons shall jointly visit the place of isolation, physically verify and the next shift Authorized Isolator upon receipt of keys shall sign on the permit as acceptance of the responsibility of continued isolation in presence of the permit initiator and executor. |
| | m | After completion of the work, permit executor shall take appropriate action to ensure that the work site is restored to a safe condition. Wherever necessary, appropriate tests (e.g. operation of equipment, traces of any flammable vapours or gas etc.) shall be conducted to demonstrate that plant and equipment are safe to operate. If there were multiple entrants into a confined space for work, the permit executer has to satisfy himself that all of them have actually come out of the confined space and physically present before him. |
| | n | Permit Initiator shall visit the work site and ensure that the site is restored to normal operating conditions and close-out the permit by accepting the work site.<br>All work permits pertaining to completed works shall be kept for at least one year and the log of permits issued shall be maintained. |
| | o | Permit Cancellation: A work permit issued shall be liable for cancellation under any of the following situations and thereafter, a fresh permit shall have to be issued.<br>• Change in the work location<br>• Change in the type of work<br>• Discovery of new hazards /risks.<br>• Expiry of permit validity<br>• Workers employed are not able to perform the work<br>• Any Emergency situation in the site |
| | p | A log of all entry into or work, in, confined spaces and such record shall contain the work and such other details of persons assigned for the work, the location of the work and such other details that would have a bearing on the safety and health of the persons assigned for this work. |
| | q | A modal format of work permit for entry/work in a confined space is enclosed herewith for guidance. This format reflects the minimum requirement, thereby the organisations are advised to not to omit any detail in their customised formats except under the guidance of a subject expert. On the other hand, if the customised format in any factory is more favourable for safety in confined space work than the modal format enclosed herewith, then the factories using such format are free to adopt the same. In both above cases, the onus to prove the same lies with occupier of the factory. |

DR. M. HARI JAWAHARLAL
SECRETARY TO GOVERNMENT

## ANNEXURE –II

(G.O.Ms.No.10, Labour Factories Boilers & Insurance Medical Services (Lab.II) Department, Dt: 06/07/2023)

**The Safety precautions to be included, but not limited to, in the training are as follows:**

1. All the confined spaces shall be got tested before permitting the entry and work in confined spaces. Before testing the confined space for entry into work, the space shall be rendered safe by washing or cleaning with neutralising agents; or purging with steam or inert gases and making adequate forced ventilation arrangements and render the confined space safe.
2. Test the work area thoroughly for the presence of any flammable vapour with the help of explosive meter. Reading shall note exceed 0% of LEL (Lower Explosive Limit). Attention shall be given to check places like drains, sumps, and flameproof areas etc; where residual traces of flammable vapours may present. Calibrated gas detector and Oxygen meter shall be used to ascertain this. The test shall be repeated at periodic intervals during the person stays inside the confined space. Similarly toxic atmosphere testing should be carried out be for entry and if required at periodic intervals (every 30 mins).

Acceptable limits of Oxygen concentration, Flammable and toxic contaminants are given in the table below:

| Substance | Acceptable levels |
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| Oxygen | 19.5-21.5 |
| Flammable | 0% |
| H2S | <10ppm |
| CO | <30 ppm |

3. In certain cases, depending up on the hazard assessment, continuous monitoring of the contaminants may be required. Safety Department representative, if required to be employed, is responsible to check the selevels. Entrant(s) shall carry the personal gas meter inside the confined space if continuous monitoring for the gas is required.
4. Complete physical isolation of all hazardous energies and utilities shall be done prior to entry in to confined space.
5. Whenever power driven rotating devices are electrically isolated e.g. vessel stirrers, the drive be lts/couplings shall also be removed in addition to LOTO.
6. For the jobs carried out where presence of flammable vapours/dust is likely to be present, inspection lamp or safety torch used shall be of flame proof type with voltage not exceeding 24 volts DC.
7. The means of access and egress inside a confined space including staging, scaffolding etc shall be arranged as per the standards leaving no scope for short comings. They shall be inspected by an experienced / Certified person for their safety and stability.

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8. The person (s) working in the confined space must wear a '5-point rescue body harness' The lanyard should be attached and be held back at the entry point by the 'stand-by person'(Attendant). They shall also be provided with appropriate and approved personal protective equipment for carrying out the work under permit to work system;
9. A responsible stand by person shall be identified as an "Attendant" who shall remain outside the confined space to keep continuous watch on the activities carried out inside the confined space. He shall be competent to execute rescue operations and appropriate actions in case of emergency. He shall never enter the confined space
10. Emergency rescue facilities i.e. rescue equipment (tripod/safety harness/rescue rope etc.) shall be kept ready before starting the work.
11. Before entry, the entrant(s) shall sign the permit form as an undertaking that he had been made aware of the work to be performed inside the confined space; hazards &risks associated with entry and the work to be performed, safe working & rescue procedures and shall abide by the safety rules & the permit conditions.
12. Permit initiator, executor, Safety Representative & respective departmental heads if any, shall also carryout random checks for adherence to permit conditions.
13. Even when all the hazard assessments have been carried out, precautions taken and protective equipment provided, a problem may occur that would require a rescue of the entrants. The safest and quickest type of rescue is the self-rescue or evacuation. Therefore, the self-rescue arrangements shall be prioritised in the rescue plan and the configuration of confined space for the work shall be done accordingly. If entrant(s) or attendant observes a prohibited condition, all entrants shall evacuate the space before the situation becomes more serious. The Attendant is responsible for ordering an evacuation if an unacceptable or unsafe condition arises and initiate the rescue operation with the permit initiator.
14. **Each entrant shall:**
    a. Maintain communication (through visual observation) with the attendant and alert when he feels uncomfortable.
    b. Exit from the confined space as soon as possible when ordered by attendant or entry supervisor or an entrant feels uncomfortable;
15. **Each attendant shall:**
    a. be physically and emotionally fit for discharging his duties in emergencies.
    b. Know the existing and pot entail hazards faced during entry

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c. Maintain communication with workers entering the confined space;
d. Remain outside the space during entry operations and held back the lanyard attached to the body harness worn by the entrant unless relieved by another authorized attendant.
e. Ensure emergency rescue facilities i.e. non-entry rescue, retrieval systems (tripod/safety harness/rescue rope etc.) shall be kept ready before starting the work in the confined space.

f. Communicate with the entrants(without entering the space) as necessary to determine whether it is still safe to work in the space;
g. Ensure that unauthorized persons stay away from the confined space.
h. Monitor activities inside and outside the confined space sand arrange an evacuation with the help of area in charge and Emergency response Team when:
    i. A prohibited condition exists;
    ii. A worker shows signs of behavioral/ physiological effect of exposure;
    iii. An emergency outside the confined space exists;
    iv. The Attendant can not effectively and safely perform the required duties;
    v. In case it is required to enter inside the confined space for rescue; a person trained in rescue shall check atmospheric conditions of the confined space before entering and if safe they can enter using SCBA/Airline Respirator, Full body safety harness attached to tripod / retractable winch arrangement and rescue the entrant.

**16. Entry supervisor {Department head area in charge) shall:**

a. Ensure that the Confined Space Entry Permit is completed correctly.
b. Know the hazards that may be faced during the entry, including information on the mode of exposure, signs or symptoms of exposure and consequences of exposure;
c. Verify that the rescue services are available and that the means for summoning them are operable;
d. Verify that emergency plan sands pacified entry conditions such as tests, procedures and equipment are in place before endorsing the permit and allowing the entry to begin;
e. Take appropriate measures to remove unauthorized persons who enter or attempt to enter the confined space during the entry operations;
f. Determine whether the entry conditions are acceptable at the confined space where entry is planned;

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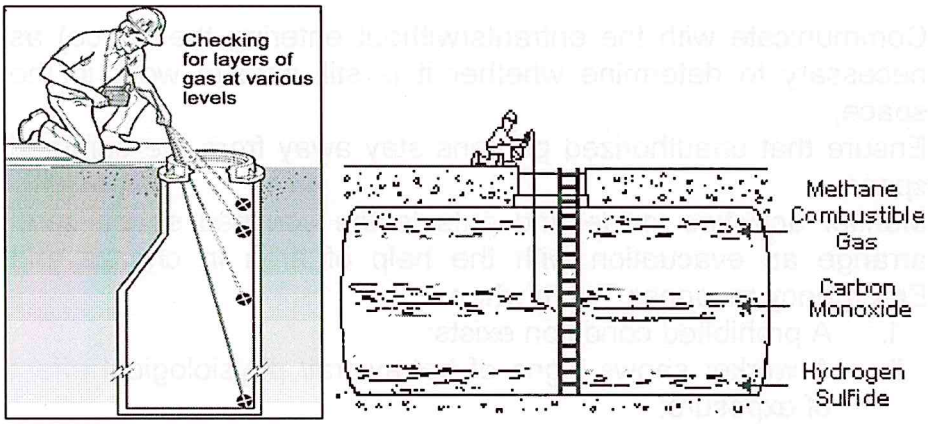
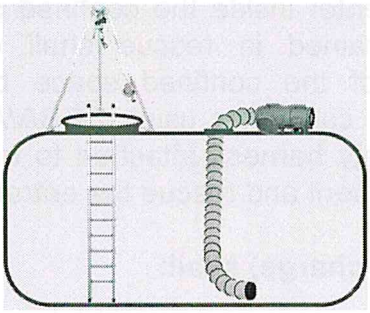
g. Ensure that entry condition remain consistent with the entry permit;
h. Terminate the entry and cancel permits when the operations governed by the entry permit are complete or if a prohibited condition exists

## Illustrative Images for Guidance

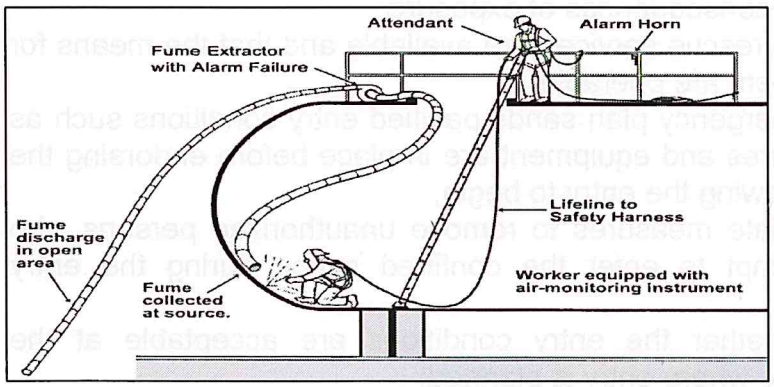
**Testing in Confined Space before permitting the entry:**




**Provision of Ventilation in Confined Space before permitting the entry:**



**Arrangement of Confined Space Work:**

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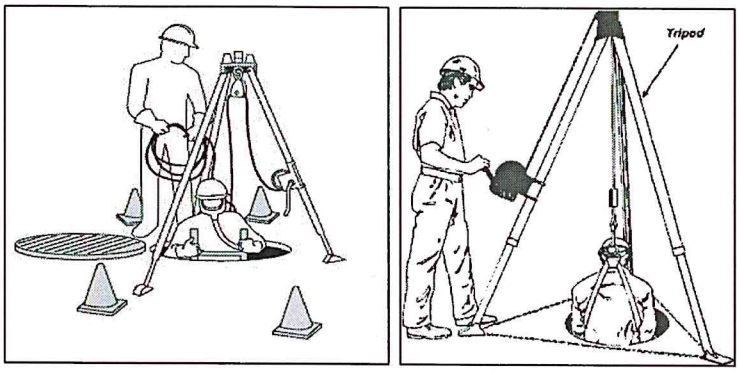
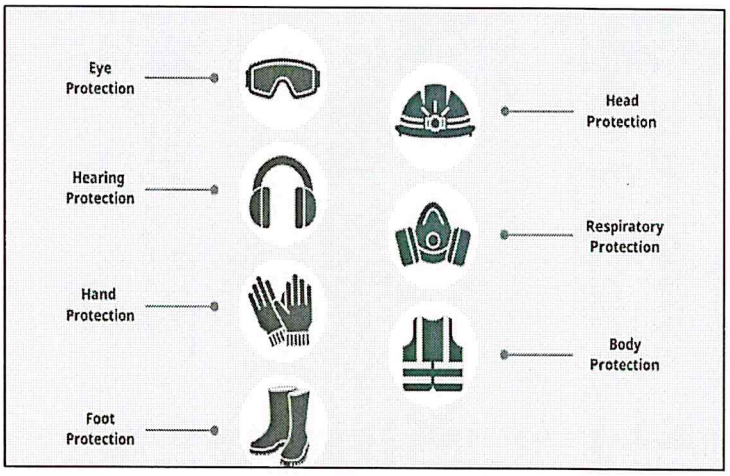
**Arrangement of Tripod for rescue:**




**Personal Protective Equipment for work in confined Space:**




Dr. M.HARI JAWAHARLAL
SECRETARY TO GOVERNMENT